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ABSTRACT

A study examined the content and form of third-, fourth-, and sixth-grade students' verbal interactions while working in cooperative groups. Teachers were asked to conduct cooperative-learning reading lessons during the observation time. A total of 32 observations of students' cooperative group work were conducted in six classrooms during regular whole-language literacy instruction. Content of students' verbal interactions was examined in terms of four general categories: procedural, academic, individualistic, and social/emotional. The form of students' discussions was examined in terms of the length of their utterances. Form was examined to describe the structure of the various types of verbal interaction content, and also to ascertain the extent to which students' utterances facilitated or hampered discussion of high-level academic content. Grade level and teacher effects were examined for both content and form. Analysis revealed that much of the students' group discussion could be characterized as on-task and non-negative in tone. Results indicated high amounts of procedural and academic talk and relatively low amounts of individualistic and social/emotional talk. The greater mean lengths of academic low-level and high-level utterances suggest that these two categories of discussion content are distinct from most or all other types of utterances. (Four figures and seven tables of data are included. Twenty-six references are attached.) (Author/MG)

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AN ANALYSIS OF THE CONTENT AND FORM OF STUDENTS' VERBAL INTERACTIONS IN COOPERATIVE GROUPS

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Abstract

This study examined the content and form of third, fourth and sixth grade students' verbal interactions while working in cooperative groups. A total of 32 observations of students' cooperative groupwork was conducted in six classrooms during regular whole-language literacy instruction.

The content of students' verbal interactions was examined in terms of four general categories: Procedural, Academic, Individualistic and Social/Emotional. These verbal interaction categories were further divided into a total of ten subcategories to provide a comprehensive description of the types of content discussed in cooperative groups. Particular attention was focused on Academic discussion content as prior research has shown it to be strongly associated with achievement gains for cooperative group participants.

The form of students' discussions was examined in terms of the length of their utterances. Form was examined to describe the structure of the various types of verbal interaction content, and also to ascertain the extent to which students' utterances facilitated or hampered discussion of high-level academic content. Grade-level and teacher effects were examined for both content and form.

Evidence is presented that much of the students' group discussions could be characterized as on-task and non-negative in tone. In addition, Academic content comprised a substantial portion of discussions, but was mostly of low cognitive complexity. High-level academic utterances were found to be the longest utterance type by far. Interpretation of the findings of this study is offered along with recommendations for future research.

An Analysis of the Content and Form of
Student Interactions in Cooperative Groups

The objective of this study was to examine the nature of third, fourth and sixth grade students' verbal interactions[1] while working in cooperative groups under naturalistic conditions. Students in this study were engaged in reading and writing tasks as part of their literature-based reading programs. Audio recordings of student groupwork and field notes on student behavior and the instructional setting were the sources of data. This study examined students' cooperative group discussions in terms of their content and form. Content was analyzed using the Taxonomy of Verbal Interaction Content (Table 1) which was developed for this study drawing upon Kalkowski (1988), Sharan and Shachar (1988) and Webb (1988). Form was considered in terms of the length of student utterances. Evidence is presented that while the great majority of students' verbal interaction could be classified as on-task (Stallings, 1980) and at least non-negative in tone, the content and form of those interactions were such that they appeared to offer limited opportunity to learn.

BACKGROUND

The term *cooperative learning* applies to a family of instructional approaches rather than to one specific method. The various cooperative learning approaches differ substantially in their structures, but they all depend on students helping each other to learn within their groups. Some of the approaches can be used across subject areas (cf. Johnson & Johnson, 1975; Sharan & Sharan, 1976), while others are subject-specific (cf. DeAvila & Duncan, 1980; Slavin, Leavey & Madden & Farnish 1986). The common elements of cooperative learning approaches are that they all involve a) groups ranging from two to six students, who b) work together to learn academic content and skills, with c) little or no direct teacher instruction during groupwork. The term cooperative learning will be used generically in this paper to refer to any instructional approach which meets these criteria[2].

Cooperative learning is being widely used in the United States and to a lesser extent in other nations as well (Ziegler, 1981; Slavin, 1988; Sharan & Shachar, 1988). Dishon and O'Leary (1984) state that, "Tens-of-thousands of teachers throughout North America are now beginning to utilize cooperative learning strategies in their classrooms (p. vii)."

Cooperative learning is designed to promote cognitive outcomes such as enhanced academic achievement, affective outcomes such as higher self-esteem and academic motivation, and social outcomes such as improved cross-racial, -ethnic, -gender, and -ability level relations (Johnson, Maruyama, Johnson, Nelson and Skon, 1981; Slavin, 1983a). According to Slavin (1983a), the positive outcomes of cooperative learning are predicated upon eliciting cooperative behaviors from students through cooperative task and incentive structures. Cooperative behaviors include supporting and encouraging teammates, asking for and providing explanations, sharing materials, listening and taking turns. These behaviors are designed to provide more academic, affective and social support than is typically available from a single teacher using a direct instruction approach.

Cooperative task structures either permit or necessitate that students work together on their assignments (Graybeal & Stodolsky, 1985).

There is growing evidence that cooperative learning can be effective in promoting academic achievement. Extensive reviews by Johnson, et al (1981), Newmann and Thompson (1987), and Slavin (1983b & 1989) have found positive achievement effects for cooperative learning over control conditions (usually individualistic and/or competitive incentive systems with direct instruction) in roughly two-thirds of the studies examined. There are several limitations to this generally encouraging research on cooperative learning. Graybeal and Stodolsky (1985) have noted that the preponderance of research on cooperative learning has been in the form of interventions by university researchers in school classrooms or laboratory studies, neither of which provides a contextualized view of this approach as it is enacted by groups of students and teachers under naturalistic conditions. Additionally, the majority of cooperative learning studies use traditional paper and pencil pre/post measures to assess student change but do not systematically examine what occurs in student groups during cooperative lessons. As a result, little is known about the content and form of student interactions during cooperative learning sessions. Since cooperative learning is highly dependent for its success on the quality of student interactions, it is important for research to examine those interactions as well as the natural contexts in which they occur.

Bossert (1988-89) suggests that research on cooperative learning needs to move beyond traditional modes of assessment and, "begin to peer into the black box of classroom interaction and study mediational processes directly (p. 235)." This study focuses on the mediational process of students' cooperative group discussions and their cognitive, affective and social components.

Verbal Interaction in Cooperative Learning Groups

Webb (1988) reviewed nineteen studies which examined students' interactions in cooperative groups in math or computer science classes in grades 2 through 11. Controlling for ability, Webb identified a number of types of help-giving/receiving interactions as predictors of academic achievement. Among her findings were that, a) giving High-Level elaborations (explaining *how* to perform a mental operation) is strongly associated with achievement gains; b) *receiving* High-Level elaborations is at best, moderately associated with achievement gains; c) giving Low-Level help (a simple answer, or procedural information such as the page number) is not related to achievement; and d) receiving Low-Level help is associated with negative achievement outcomes.

Work by the Johnsons and their colleagues lends further support for the value of students verbalizing complex cognitive explanations in their groups. An experimental study by Johnson, Johnson, Pierson and Lyons (1985) tested the value of academic controversy by randomly assigning fourth- through sixth-grade students to cooperative learning groups with either controversy or concurrence-seeking conditions. All the groups were to prepare reports synthesizing their views on controversial social studies issues such as alternative versus traditional energy sources. Concurrence-seeking groups were given pro and con materials and instructed to share ideas, compromise quickly and not argue. Students in controversy groups were divided into pro and con advocates, given materials for their own positions only, and were told to support their positions and change only if convinced. Students in the controversy condition scored higher on achievement motivation and on immediate and delayed assessments of achievement and perspective-taking ability.

The work of Webb (1988) and Johnson, et al (1985) indicates that high quality cooperative group discussions contain detailed, cognitively complex exchanges regarding academic content. Webb's (1988) review provides strong evidence that it is important for students to verbalize their knowledge in their cooperative groups in the form of high cognitive level explanations. While Johnson, et al's (1985) study did not examine

interactions within groups, it offers strong evidence that prolonged discussion of understanding and reasoning regarding complex issues can contribute to lasting cognitive and affective outcomes. Kagan (1986, p. 254), citing the Johnson's research along with Bloom (1964) and Bruner (1961 & 1966), further asserts, "Complexity and variety of input [provided by students to their teammates] leads to higher level cognitive development." Further support for the association of cooperative learning with cognitive complexity can be found in Newmann and Thompson's (1987) review of of cooperative learning studies in secondary grades. In the eight studies which differentiated between low- and high-level cognitive objectives, Newmann Thompson (1987) found only a 38% rate of significant achievement on low-level objectives while, "In contrast, all cooperative methods showed exceptional, even monumental, advantages for higher cognitive items... (p. 8)." It appears from the work of Webb (1988), Johnson, et al (1985), and Newmann and Thompson (1987) that cooperative learning is especially effective when it involves group discussion and tasks focusing on high cognitive level content.

Sharan and Shachar (1988) examined the content and form of eighth students' verbal interactions and academic achievement under instructional conditions of cooperative learning and direct instruction in an Israeli school. Sharan and Shachar compared five classes using *Group Investigation* (GI; Sharan & Sharan, 1980) and four which utilized traditional whole class (WC) instruction. Two-thirds of the students were of Western extraction (European, South or North American and South African) and middle class, while one-third were natives of the Middle East and lower class. Middle Eastern students were generally at a disadvantage both socially and academically in this and other Israeli schools. Sharan and Shachar found that students from both groups spoke more in terms of total words and words per turn of speech in the GI classes, with a lesser differential between groups indicating a gain in status for the Middle Eastern students (Cohen, 1984). Students in the GI condition also verbalized significantly more cognitive strategies, which offers significant cognitive benefits (Webb, 1988). Another finding of note in this study is that a

significant amount of the variance in students' achievement scores was accounted for in regression analyses by the types of verbal interactions in which they participated.

Despite the evidence that it is important for students to verbalize their knowledge and strategies in cooperative groups, research suggests that discussion of academic content does not comprise a large part of students' cooperative group interactions. Kalkowski (1988) observed and analyzed elementary school students' cooperative discussions over a two year period and found that academic content accounted for 28% of all verbal interactions: 7% - requests for information(request for information not necessarily accessible to each member, usually academic in nature), and 21% - information-supply (supply of information not necessarily accessible to each member, usually academic in nature; p. 7). The other types of verbal interaction she found were: 29% - social/emotional; 27% - procedural supply; 8% - noncategorizable; 5% - procedural demand; and 4% - procedural request. Examining Kalkowski's (1988) findings further, it is apparent that only 21% of the students' interactions (information supply) could have been of high cognitive level. Furthermore, it might be fair to hypothesize that a large proportion of the information-supply interactions were of low cognitive level since the preponderance of total interactions concerned non-academic content. Since Kalkowski (1988) did not distinguish between low and high cognitive level academic content it is impossible to establish the percentage of the students' interactions which were of high cognitive level. Additionally, we do not know just how high a percentage of high level interactions in a cooperative group is optimal. At any rate, Kalkowski's (1988) findings suggest that students may not discuss academic content at a high cognitive level as much as would seem desirable in their cooperative groups.

Blumenfeld and Meece's (1988) recent study of science instruction in fourth through sixth grade classes offers further evidence that students in cooperative groups may not engage their academic content at a high cognitive level as much as would seem desirable. Through post-instruction questionnaires, they found students reported using

fewer high-level cognitive strategies in lessons which involved small group learning or which were in other ways procedurally complex.

The challenge faced by students in cooperative learning groups as they attempt to discuss their academic content should not be underestimated. Students in cooperative groups must construct a participation structure which differs substantially from the modal recitation format (cf. Bellack, Kliebard, Hyman & Smith, 1966; Goodlad, 1984). A cooperative group participation structure in which members freely and regularly share their knowledge and strategies may be quite incomprehensible to students who lack prolonged exposure to it. Mehan (1979) has examined classroom interactions in teacher-directed, large- and small-group discussions during literacy instruction and noted that in order for a student's verbal interaction to be successful (to be incorporated into the flow of the discussion) it has to be appropriate in both content and form. Mehan found that the manner in which classroom rules were mutually constructed and used by the teacher and students in his study facilitated the exchange of certain types of information and inhibited others.

Students in cooperative groups may also establish rules, or norms, which facilitate discussion of particular types of content and inhibit others. The work of Johnson, et al (1985), Newmann and Thompson (1987) and Webb (1988), suggests that it would be desirable for students in cooperative groups to focus a significant amount of their discussions on high cognitive level academic content. One way in which cooperative groups may either facilitate or inhibit discussion of high cognitive level content is in the length of the student utterances. An *utterance* will be defined as an uninterrupted turn of talk by one student. The complex explanations required to justify opinions in Johnson, et al's (1985) study, or to elaborate on cognitive operations as in Webb's (1988) review, would seem to require fairly long utterances by students. That is, students must have available, and utilize opportunities to explain their reasoning in detail in order for cooperative group discussions to include exchange of high cognitive level content.

Therefore, the *form* of students' verbal interactions -- in terms of the length of their utterances is important in addition to the content of those interactions.

Whole Language Instruction

The whole-language, or literature-based, approach to literacy instruction would seem to offer students an ideal opportunity to discuss academic content at high cognitive levels. The whole language approach involves the study and use of written and oral language in the context of authentic tasks (Goodman, 1986). Authentic tasks are tasks which serve a genuine communicative intent of the individual student, such as reading a trade book which s/he has chosen or writing a letter to a friend (Pearson, 1989). Whole language instruction requires students to spend extensive classroom time reading and writing, both alone and in conjunction with peers and the teacher. Whole language instruction, like cooperative learning, relies on discussions to allow students to construct, reinforce and apply learning, in this case through dialogues about text. Pearson (1989) notes that in a whole-language program, "an active interpretive community is necessary in order to support comprehension (p. 234)."

Cooperative learning groups offer a structural means for increasing dialogue opportunities within the whole language classroom since a number of student-run groups can operate simultaneously. Whole language reading programs provide students with an interpretive orientation toward learning conducive to high cognitive level discussions, while cooperative learning provides a structure for guiding students' group processes. It must be noted that verbalization of lower cognitive level academic content is quite appropriate in reading instruction in addition to high-level content. For example, oral reading provides students with an opportunity to develop fluency and comprehension (Dahl, 1972; Perfetti, 1985). Oral reading by itself, without accompanying discussion of comprehension or strategies, would be considered low cognitive level verbal interaction content (by the criteria being used in this study, Table 1). Therefore, high-quality cooperative group

discussions in a whole-language classroom would likely contain substantial amounts of both low and high cognitive level verbal interactions.

A Taxonomy of Verbal Interaction Content

The Taxonomy of Verbal Interaction Content (Table 1) was developed for this study in order to provide a comprehensive framework for examining the content of students' cooperative group discussions. This taxonomy expands upon Kalkowski's (1988) by drawing upon Sharan and Shachar (1988) and Webb (1988) to consider cognitive complexity. Other modifications were drawn from Sharan and Shachar (1988) and Slavin (1983). Verbal interaction content was examined in terms of four general categories: Procedural, Academic, Individualistic and Social/Emotional. Each of these general categories was divided into two or more subcategories totalling ten in all.

The *Procedural* content category of verbal interaction concerns issues such the proper format for completing a task or the division of labor within the group. From Blumenfeld and Meece (1988) and Kalkowski (1988), these issues would appear to be major concerns for students in cooperative groups. The Procedural category was divided into the subcategories of *Nondirective* and *Directive* to differentiate between questions or suggestions versus imperatives. The final Procedural subcategory, *Attempt at Closure* , refers to suggestions or imperatives by students designed to bring discussion of a particular topic to an end. This subcategory was added to the Procedural category during the course of data collection when the salience of this type of utterance was noted in several classroom observations. Groups in several observations were observed to hurriedly vote on members' ideas rather than discussing them in detail, thus mitigating against cognitive complexity of discussions. The Procedural Attempt at Closure subcategory is subsumed under both the Nondirective and Directive subcategories; no attempt was made to differentiate between nondirective and directive attempts at closure.

The *Academic* content category includes any verbal interaction that involves cognitive operations. The subcategories of *Low-Level* and *High-Level* content, along with *Requests for Information* are included within the Academic category. As with Webb's (1988) review, Low-Level content refers to statements which include only information without an explanation, while High-Level content includes both information and an explanation or reasoning. Academic Requests include questions or statements soliciting either Low- or High-Level academic content.

Individualistic discussion content includes any verbal interactions which indicate that the speaker is diverging from the academic task as it is being engaged by the group at that time. Slavin (1983a) has asserted that one of the essential elements of cooperative learning approaches is eliciting cooperative as opposed to individualistic behaviors from students. These cooperative behaviors include discussing the group's task and helping other members. The Individualistic content category is divided into two subcategories, On-Task and Off-Task. Individualistic On-Task discussion content includes statements by students indicating that they are going to pursue some facet of the group's task on their own. Individualistic Off-Task content includes any talk that is unrelated to the group's task.

The *Social/Emotional* content category refers to any talk that is primarily affective in nature. This category is similar to ones used by Kalkowski (1988) and Sharan and Shachar (1988). The Social/Emotional category was divided into both Positive and Negative subcategories to differentiate between supportive versus personally critical statements. Criticism of *ideas* , would be classified as Academic High-Level if a reason is provided, or Low-Level if not.

Purpose

This study sought to describe and interpret the content and form of third, fourth and sixth grade students' cooperative group discussions in the context of their regular literature-

based language arts instruction. Discussion content was categorized using of the Taxonomy of Verbal Interaction Content (Table 1). Form was analyzed in terms of the length (number of words) of student utterances, similar to Sharan and Shachar's (1988) procedures. Verbal interaction content and form were examined across all observations and by grade-level. In addition, content was examined by teacher, while form was examined in terms of content category. Grade-level and teacher effects were investigated in order to ascertain the generality of the findings as well as to identify and interpret sources of variance. Form was investigated in terms of content to identify the average length of utterances within the various content categories. This was done to describe the nature of the various types of utterances, with particular attention to the Academic content subcategories. The length of student utterances was examined in this study in order to ascertain the extent to which students had available and utilized opportunities to explain their ideas and reasoning in detail.

The intent of this study then, was to provide an exploratory description under naturalistic conditions of the content and form of students' verbal interactions in cooperative groups. By examining students' discussions in terms of both their content and form, with attention to cognitive complexity, insight is provided into the nature of cooperative group discussions along with the likelihood of those discussions fostering higher order thinking.

RESEARCH QUESTIONS

1. What is the distribution of content of students' verbal interaction in cooperative groups across all observations?

2. What is the distribution of content of students' verbal interaction in cooperative groups by grade-level?

3. What is the distribution of content of students' verbal interaction in cooperative groups by teacher?

4. What is the form (average length of utterances) of students' verbal interaction in cooperative groups across all observations?

5. What is the form (average length of utterances) of students' verbal interaction in cooperative groups by grade-level?

6. What is the form (average length of utterances) of students' verbal interaction in cooperative groups by content?

METHODS

Participants

Five teachers and six classes of elementary school students from a moderate-sized city in the West participated in this study (2 third-, 2 fourth- and 2 sixth-grade classes). The fourth-grade teacher taught morning and afternoon sections of language arts, and data were gathered in each. All teachers were anglo females and volunteered to participate in the

study. The distribution of grade-levels in the study reflects the availability of teacher-volunteers.

Each of the teachers identified herself as using literature-based approach to language arts. None of the teachers reported utilizing basal reading texts. All of the teachers stated that they use cooperative groups as a major component of literacy instruction. Each of them reported using some form of cooperative learning at least three times per week. All of the participating teachers had received the equivalent of at least three semester hours of staff development in cooperative learning methods offered by their school district and/or local universities. As this study was conducted late in the school year, during May, both the teachers and their students were presumably quite familiar with this instructional approach.

The students were predominantly anglo and middle class, and the classes were heterogeneous in ability. Approximately three-fourths of the students in the classes had written parent-permission to participate in the study. No data were collected on students without parental consent.

Procedures

Data were collected during May, 1989. The teachers were told that the purpose of the study was to examine cooperative discussions and activities. Teachers were asked to conduct cooperative reading lessons during the agreed-upon observation days but were otherwise left to plan the lessons as they chose. The observed lessons included: Grade 3 -- adapting stories to play format; Grade 4 -- designing a board game utilizing multi-disciplinary activities; Grade 6 -- story writing for a second-grade book pal, writing a class memory book, a newspaper scavenger hunt, and analyzing characters in trade books.

Each class was observed on three days during the same week. Each lesson observation lasted between 30 and 60 minutes. During these observations, descriptions of the curricular activities and setting were collected along with notes on student behavior and non-verbal communication. Two researchers were present during each observation. Each

researcher randomly selected a different student group each day for observation and placed a tape recorder near the group so that their discussions could be recorded. A total of 36 group sessions was observed (6 classes X 3 observations X 2 groups per observation). Technical problems, as well as shorter observations which permitted more than one group to be observed during a session resulted in imbalanced totals of observations across the six classrooms. The actual total of observations examined was 32 with the following distribution by grade and teacher: Grade 3) Teacher 1 -- 5 observations, and Teacher 2 -- 8 observations; Grade 4) Teacher 3 -- 6 observations in the a.m., and 5 observations in the p.m.; Grade 6) Teacher 4 -- 4 observations, and Teacher 5 -- 4 observations.

All audio tapes of students' groupwork sessions were transcribed for analysis. Field notes were combined with the transcripts to add relevant contextual data. Elements of the physical setting such as the arrangement and movements of students and materials were noted. The socio-emotional climate was also observed and noted in terms of students' nonverbal expressions, conflicts and interaction with other groups or the teacher.

The students' verbal interactions were coded for content as one of the ten subcategories of the Taxonomy of Verbal Interaction Content (Table 1). Each uninterrupted turn of talk by a student was considered an *utterance*. Totals of utterances and words for each verbal interaction content subcategory were recorded for each observation. Utterance and word totals were converted into percentages for each content subcategory for each observation. Conversion to percentages was necessary for comparing across observations, since the amounts of talk within observations varied. Mean percentages of utterances offer insight into the range and distribution of discreet turns of talk within the subcategories of verbal interaction content. Mean word percentages offer a sense of the relative amounts of discussion time devoted to the various content subcategories since utterances vary in length by number of words (as well as by time).

Students' verbal interactions were analyzed in terms of their form (words per utterance) in addition to their content. There were a few instances in which a sing!

utterance contained distinct elements of two of the content categories. In such cases, the utterance was categorized as two separate utterances. The rationale for splitting an utterance in this manner was that it allowed a truer categorization of the content than would be the case by simply forcing it into a single category. The drawback was that this splitting distorted the length and total of utterances in analysis of their form. There was fewer than one such case per observation, however, so the impact of this utterance splitting on the structural analysis was deemed negligible.

A graduate assistant experienced at coding transcripts did all of the coding for the study. A stratified random sample (representing each grade, teacher and classroom) of seven (21.8%) of this rater's observations was independently coded by one of the primary investigators. Pearson Product-Moment correlations of interrater agreement averaged r = .947, and ranged from r = .882, to r = .991.

Data Analysis

Statistical analyses of discussion content (Research Questions 1, 2 & 3) were conducted for percentages of utterances and percentages of words. To address Question 1, descriptive statistics (mean, standard deviation) were calculated for percentages of discussion content categories and subcategories (as described in Table 1) across observations. Descriptive statistics were also calculated by grade-level and by teacher to address Research Questions 2 and 3, respectively.

In order to assess the significance of differences in distribution of discussion content by grade-level and teacher for Research Questions 2 and 3 respectively, a series of inferential tests was conducted with an alpha of $p < .05$ for all tests. Each set of tests was conducted four times: first for utterance data and then word data; and with Grade and then Teacher as the independent variable. The first step was to run a MANOVA with the four general verbal interaction content categories -- Procedural (Pro), Academic (ACA), Individualistic (IND), and Social/Emotional (SOC) as dependent variables. Each of these

dependent variables consisted of the sum of its associated subcategory data. For example, the Academic category was the sum of the percentages for Academic Low-Level, Academic High-Level and Academic Requests. When a significant main effect was found for the MANOVA test, univariate-F's were inspected to identify which of the dependent variables evidenced grade-level (or teacher) differences. Finally, post-hoc Scheffé tests were conducted to identify which grades (or teachers) were significantly different from the others on the dependent variables which had showed significant MANOVA and univariate results. This sequence of tests was then repeated with the ten individual subcategories of discussion content (Procedural Nondirective through Social/Emotional Negative) as dependent variables. These procedures were utilized in order to assure that observed differences in discussion content were not likely the result of interrelationships among the dependent variables.

The form of students' verbal interactions was analyzed in order to address Research Questions 4, 5 and 6. The form of verbal interaction was examined in terms of the length of student utterances (total words divided by total utterances). Descriptive statistics (mean, standard deviation, frequency distribution, skewness) of the length of student utterances were calculated for total utterances across all observations in order to answer Question 4. Descriptive statistics were calculated by grade-level in order to address Question 5. Descriptive statistics were also calculated for utterance length by each discussion content subcategory in order to address Question 6. Repeated measures ANOVA tests ($p < .05$) were utilized to compare utterance lengths by grade-level and by discussion content subcategories.

RESULTS

The total data base for the study consisted of 6952 utterances and 48,201 words. Results will be reported in this section organized by the research questions. Discussion is withheld until all findings have been presented due to their interrelatedness.

Findings

For Research Questions 1, 2, and 3, which address content, the findings will be presented first in terms of the four general discussion content categories and then proceed to the ten content subcategories. Utterance data and word data produced nearly identical results throughout analyses pertaining to Questions 1, 2 and 3. In the interest of brevity and clarity presentation of findings will focus on utterance data. Results of word data analyses will be presented only where they differ from results on utterance data.

1. What is the distribution of content of student interaction in cooperative groups across all observations?

The descriptive statistics (means and standard deviations) for the percentages of utterances and words in the four main verbal interaction content categories -- Procedural, Academic, Individualistic and Social/Emotional were aggregated across all observations (Table 2). These figures indicate that students' group discussions were composed primarily of Procedural (PRO) and Academic (ACA) talk, followed by far lower amounts of Individualistic (IND) and Social/Emotional (SOC) talk. The Procedural category was most prevalent in utterances at 48.36%, followed by Academic at 42.22%, yet the order of these categories was reversed in word totals with Academic higher at 53.16% to 40.83%. The Individualistic and Social/Emotional categories of interaction are consistent across utterance and word totals with the Individualistic utterance mean of 7.83% and word mean of 5.12% both higher than the corresponding Social/Emotional means of 1.59% and .69%. The Individualistic category of talk had the greatest variance in distribution with standard deviations greater than its means for both utterances and words.

Since utterance totals indicate the number of discreet verbal interactions within a particular content category and word totals suggest the relative amounts of discussion time devoted to the various categories, Procedural content can be seen as the focus of the

greatest number of discreet student interactions, while Academic content occupied a majority of discussion time.

A more detailed picture of students' group discussions can be elicited from the means and standard deviations of the ten subcategories of interaction content as displayed in Table 3. The mean utterance percentages for these content subcategories are displayed in Figure 1. The subcategory data indicate that the major part of students' Procedural talk was comprised of Nondirective (PND) talk at 42.01% of total utterances and 37.13% of total words. Procedural Directive (PD) talk was far behind Nondirective at 5.62% of total utterances and 3.36% of total total words. The Procedural Closure (PCl) category comprised only .74% of total utterances and .34% of total words. Distribution across observations of Procedural talk was fairly consistent for the Nondirective (utterance SD = 20.52) and Directive (utterance SD = 4.74) subcategories. Only two observations contained no Nondirective utterances and these were both extremely short observations. Seven observations had no Directive utterances. The Procedural Closure category was distributed quite unevenly (utterance SD = 1.23), with 67% of the observations having no Procedural Closure talk, while six observations accounted for 73% of these utterances.

The Academic (ACA) category of interaction content consisted primarily of Low-Level (ACL) verbal interactions at 35.68% of total utterances and 39.45% of total words. Within the Academic content category, Low-Level talk comprised 90.95% of utterances and 74.21% of the words. Academic content High-Level (ACH) verbal interactions comprised 3.61% of total utterances and 11.05% of total words. The Academic content High-Level subcategory shows the greatest disparity between utterance and word percentages since these utterances had the greatest mean length (See the findings for Research Question 6). Academic Content Requests (AC?) comprised a small portion of group interactions at 2.92% of total utterances and 2.66% of total words. The distribution of Academic talk across observations was fairly even for the Low-Level and Request subcategories and less so for the High-Level subcategory. Academic Low-Level utterances

were distributed across all observations except one, which was extremely short, yet were quite uneven in distribution as indicated by the high standard deviation (SD = 24.60). High-Level utterances (SD = 7.13) were quite uneven in distribution across observations with 40% having no such utterances.

The Individualistic category of interaction content was composed primarily of Off-Task talk at 5.18% of total utterances compared with On-Task utterances at 2.65%. The word totals for these two subcategories are more equal, however, with Individualistic Off-Task at 2.70% only slightly higher than On-Task at 2.66%. Utterances within the Individualistic category were distributed across all but six observations, yet were quite uneven in frequency. Within the Off-Task subcategory, five observations accounted for 60.36% of the total words (SD = 4.30). Within the On-Task subcategory, three observations accounted for 72.60% of the word total (SD = 4.87).

The Social/Emotional category of verbal interaction content had a higher percentage of Positive (SE+) than Negative (SE-) talk at 1.07% to .52% of utterance totals, and .52% to .17% of word totals, respectively. The Positive utterances (SD = 1.29) were distributed fairly evenly with 67% of the observations having at least one, and a maximum of ten. The Negative utterances (SD = 1.13) were more varied in distribution, with a majority (56.66%) coming from three of the observations, while 70% of the observations had no Negative utterances.

2. What is the distribution of content of students' verbal interaction by grade-level?

The distribution of students' cooperative group talk among the general interaction content categories by grade-level is displayed by utterances and words in Table 4. The higher level of Procedural talk (66.01% of utterances) and lower level of Academic talk (22.74%) for Grade 4 are quite striking. In order to systematically assess the significance of differences in mean percentages of interaction content categories by grade-level the series of inferential tests described above was utilized.

The first MANOVA procedure (for utterances) indicated a significant grade-level main effect ($F(8,54) = 2.146$, $p < .047$) for mean percentages of utterances across the four general interaction content categories. The univariate-F tests ($df = 2,29$) indicated significant grade-level effects for Procedural ($F = 7.300$, $p < .003$) and Academic ($F = 8.004$, $p < .002$). No significant grade-level effects ($p < .05$) were found for the categories of Individualistic and Social/Emotional talk. Scheffé tests ($df = 2, 29$) revealed the following grade-level effects on the mean percentages of interaction content: 1) Procedural -- Grade 4 ($M = 66.05\%$) was significantly higher than Grade 3 ($M = 39.92\%$) and Grade 6 ($M = 37.84\%$), ($F = 7.296$, $p < .0027$); 2) Academic -- Grade 3 ($M = 53.21\%$) and Grade 6 ($M = 51.14\%$) were significantly higher than Grade 4 ($M = 22.74\%$), ($F = 8.005$, $p < .0017$).

Following the analysis of the four major categories of verbal interaction, the ten subcategories were examined. The distribution of students' utterances by grade-level among the content subcategories is enumerated in Table 5 and displayed in Figure 2. As would be expected from the grade-level analysis of the general verbal interaction categories, several of the subcategories within the Procedural and Academic categories appear to differ substantially by grade. Grade 4 appears quite high on Procedural Nondirective utterances ($M = 55.99\%$) and quite low on Academic Low-Level ($M = 17.48\%$). Additionally, both Grades 3 ($M = 1.30\%$) and 4 ($M = 1.58\%$) appear quite low on Academic Content High-Level utterances compared to Grade 6 ($M = 10.12\%$). The MANOVA procedure for the content subcategories (Procedural Nondirective through Social Emotional Negative) indicated significant grade-level effects ($F(20, 42) = 2.591$, $p < .005$). Univariate F-tests ($df = 2,29$) showed significant grade-level effects for the Procedural subcategories of Nondirective ($F = 4.905$, $p < .015$) and Directive ($F = 7.328$, $p < .003$), and for the all the Academic subcategories, Low-Level ($F = 7.668$, $p < .002$), High-Level ($F = 5.814$, $p < .008$) and Requests ($F = 5.180$, $p < .012$).

The significant univariate results were followed with Scheffé post-hoc procedures. Significant Scheffé test ($df = 2, 29, p < .05$) results within the Procedural category were: a) Nondirective -- Grade 4 was significantly higher than Grade 3 (on utterances), and significantly higher than Grades 3 and 6 on word percentage; b) Directive -- Grade 4 was significantly higher than Grade 6. The outcomes of the Scheffé tests indicate that the greater proportion of Procedural talk for Grade 4 relative to Grades 3 and 6 was due to differences in the subcategories of Nondirective and Directive talk and not to the Attempts at Closure subcategory. Moreover, the word difference between Grades 4 and 6 on Nondirective talk, coupled with the lack of an utterance difference, suggests that this type of talk occupied a substantially greater proportion of discussion time in Grade 4 than Grade 6, yet not a significantly greater proportion of topics addressed.

The Scheffé tests ($df = 2, 29, p < .05$) of mean percentages of utterances in the Academic subcategories by grade-level obtained the following significant results: a) Low-Level -- Grade 3 was higher than Grade 4; b) High-Level -- Grade 6 was higher than Grades 3 and 4; c) Requests -- Grades 6 and 4 were higher than Grade 3. These findings indicate that the significantly higher percentages of Academic talk found for Grades 3 and 6 compared with Grade 4 were due to greater amounts of Low-Level talk for Grade 3 and High-Level talk for Grade 6.

3. What is the distribution of content of students' verbal interaction in cooperative groups by teacher?

The mean percentages of utterances in the general interaction content categories by teacher are presented in Table 6. All data were examined for teacher effects using the same set of statistical procedures as for grade-level effects (MANOVA, univariate-F and Scheffé tests) substituting Teacher for Grade as the independent variable. Teachers 1 and 2 were nested within Grade 3; Teachers 4 and 5 were nested within Grade 6; and Teacher 3 was crossed with Grade 4, as she taught both classes of Grade 4 students. MANOVA tests

yielded nonsignificant results for both utterances ($F(16,108) = 1.30$, $p < .213$) and words ($F(16,72) = 1.299$, $p < .222$).

The mean percentages of utterances in the ten interaction content subcategories by teacher are presented in Table 7. The MANOVA test for teacher effects on the ten discussion content subcategories (Procedural Nondirective through Social/Emotional) found nonsignificant results for utterances ($F(40,84) = 1.366$, $p < .116$) and words ($F(8, 36) = 1.138$, $p < .363$).

4. What is the form (average length of utterances) of students' verbal interaction in cooperative groups across all observations?

Analysis of utterance length of students' cooperative group interaction was conducted on a smaller scale than the analysis of content, as form was a lesser focus of the study. The form of the general discussion content categories of Procedural, Academic, Individualistic and Social/Emotional was not considered significant, so analysis proceeded directly from overall form, to form by grade-level, to form by subcategories.

The mean utterance length across all observations was 6.933 words. The fairly large standard deviation ($SD = 7.731$) indicates that there was considerable variance in utterance length. The strong positive skew ($\gamma 1 = 3.965$) of the distribution indicates that the majority of student utterances were quite short (56.57% < 6.0 words), although there were some very long utterances. Combining the first two intervals (of five words each) in the frequency distribution of utterance lengths indicates that 82.09% of all utterances consisted of 10 words or less. Fewer than 2% of all utterances exceeded 21 words in length. Utterance length ranged from 1 to 101 words. Figure 3 illustrates the frequency distribution of utterance length. The extreme positive skewness is apparent.

5. What is the form (average length of utterances) of students' verbal interaction in cooperative groups by grade-level?

Grade-level means for utterance length showed Grade 4 to once again be the outlier. The grade-level means for utterance length were as follows: Grade 3, $M = 7.947$ ($SD = 8.10$); Grade 4, $M = 6.476$ ($SD = 6.259$); Grade 6, $M = 7.757$ ($SD = 11.282$). A repeated measures ANOVA test ($df = 2, 2108$, $p < .05$) with grade-level as the independent variable and mean utterance length as the dependent variable indicated that the utterance lengths of Grade 3 ($F = 7.174$) and Grade 6 ($F = 5.444$) were both significantly greater than for Grade 4.

6. What is the form (average length of utterances) of students' verbal interaction in cooperative groups by content?

The form of utterances in terms of their mean lengths within the ten interaction content subcategories is displayed in Figure 4. Predictably, utterances within two of the Academic content subcategories -- Low-Level ($M = 12.254$, $SD = 15.732$) and High-Level ($M = 24.907$, $SD = 19.128$) were the longest. The only other utterance type with a mean length greater than the grand mean was Procedural Nondirective ($M = 7.141$, $SD = 4.600$). The shortest utterance type was Social/Emotional Negative ($M = 4.33$).

A repeated measures ANOVA was utilized to compare the mean utterance lengths by subcategories. Pairwise comparisons revealed the following significant differences in utterance lengths ($df = 1, 18$, $p < .05$): a) Procedural Closure were longer than Social/Emotional Negative utterances; b) Academic Low-Level utterances were longer both the Individualistic subcategories and both the Social/Emotional subcategories; c) Academic High-Level utterances were longer than all other subcategories.

Discussion

Discussion will be presented first in terms of overall findings (across all observations) regarding verbal interaction content and form, then in terms of grade-level and teacher effects. This organization should help to unravel some of the interrelated findings for grade-level and teacher effects which pertain to both content and form.

Among the most striking findings in this study are the high amounts of Procedural and Academic talk and the relatively low amounts of Individualistic and Social/Emotional talk. Also, the lower amounts of Academic talk, and shorter utterances in Grade 4 compared with Grades 3 and 6 are quite surprising. Finally, the greater mean lengths of Academic Low-Level and High-Level utterances suggest that these two categories of discussion content are distinct from most or all other types of utterances.

Interaction Content and Form Overall

The students' cooperative group verbal interactions in this study could be generally characterized as on-task (Stallings, 1980), group-oriented, primarily Procedural and Academic in focus, and containing only trace amounts of negative comments or "put-downs". These are quite positive findings. However, further examination suggests that the cooperative group discussions observed also have room for improvement. The overall mean utterance length was fairly short, suggesting that discussion form placed a significant limit on students' opportunity or likelihood of expressing complex concepts. Also, the amount of Academic High-Level talk was quite low, especially for whole-language reading instruction which espouses strategic thinking as a major goal (Pearson, 1989).

Analysis of the form of students' cooperative group interactions indicates that the preponderance (82.09%) of utterances consisted of ten words or less, while a majority (56.57%) consisted of five words or less. It is unlikely that such short utterances are capable of expressing complex cognitive thoughts. This contention is supported by the mean length of Academic High-Level utterances at nearly 25 words. Whether students

were simply not thinking in a High-Level manner which contributed to short utterances, or whether short utterances hampered their abilities to express High-Level thoughts is problematic. At any rate, these data indicate that complex cognitive discussion is composed of long utterances and these students expressed few such utterances.

The preponderance of Procedural and Academic talk (combined word totals = 93.99% of total) in these observations indicates that for the most part, students were engaging in their learning tasks a great deal of the time. The majority of discussion time (as indicated by the word mean of 53.16%) was comprised of Academic content, the general type of interaction most closely associated with higher achievement (Johnson, et al, 1985; Newmann & Thompson, 1987; Webb, 1988). Compared with Kalkowski's (1988) finding of only 28% academic talk (21% information supply + 7% information request), this is quite encouraging. At the same time, the levels of Individualistic talk were quite low (5.12% of words), indicating that students were generally concentrating on working with their groups. The extremely low amounts of any kind of Social/Emotional talk indicate that the students did very little praising or insulting.

The Procedural Nondirective, Academic Low-Level, and Individualistic Off-Task verbal interaction content subcategories comprised the major part of their respective general categories. For the Procedural category, this is encouraging, as it suggests that students' interactions could be characterized as polite or considerate (Nondirective) as opposed to authoritarian (Directive). The extremely low level of Closure talk (.74% of utterances) is also encouraging. This indicates that the tendency observed during some of the field observations for the students to immediately vote on members' ideas rather than discussing them in greater detail and depth was not a widespread tendency. However, all Procedural talk is at best, unrelated to achievement for the speaker, and is predictive of negative achievement for the receiver if s/he needed a High-Level explanation (Webb, 1988). So while Procedural talk may serve to move the group along toward completing its academic task, it does not of itself offer potential for cognitive gain.

The breakdown of the Academic content category into its subcategories indicates that the preponderance of Academic talk was comprised of Low-Level talk (90.95% of Academic utterances/ 74.21% of words). Academic Low-Level talk is limited in its prediction of achievement for the speaker as well as the listener (Newmann & Thompson, 1987; Webb, 1988). A positive aspect of the Low-Level talk observed is that much of it, especially the longer utterances, consisted of students reading orally. This reading often consisted of text which the students had written themselves. As noted, oral reading can contribute to decoding skills (Dahl, 1979) and comprehension (Perfetti, 1985). Unfortunately, this reading of students' written products was seldom followed by analysis or critique, as evidenced by the low amounts of High-Level talk. High-Level interactions, which are strongly predictive of achievement for the speaker and moderately so for the recipient comprised a fairly low amount of total discussion in student groups (3.61% of utterances/ 11.05% of words). The greater mean length of Academic High-Level utterances compared with all other content subcategories indicates that when students did speak at high cognitive levels, they did so in utterances which were of sufficient length to support explanation of complex reasoning. The modest amount of Academic requests (2.92% of utterances) suggests that students did not rely much on their peers to provide explanations of academic content. Strategic questions regarding comprehension of text (Palinscar & Brown, 1984) were rarely observed; rather Academic Requests tended to be solicitations of simple academic content explanations such as, "How do your spell dungeon?" Such questions and their answers are quite limited in their prediction of achievement gain for both participants in the exchange (Webb, 1988).

The Individualistic category of interaction content was composed of greater amounts of Off-Task than On-Task utterances, although the difference was statistically nonsignificant, and negligible in terms of words (2.70% and 2.42%, respectively). In general, the low levels of both Individualistic Off-Task and Individualistic On-Task talk suggest that the students in this study were quite task-oriented as well as group-oriented.

The very low amount of Off-Task talk indicates that elementary students can and will stay on-task (Stallings, 1980) in cooperative reading groups, which is a very positive finding when compared with other studies of reading follow-up activities (cf. Anderson, Brubaker, Alleman-Brooks & Duffy, 1985).

The general distribution of talk in these observations indicates that students were engaging in at least minimally acceptable types of discussion the great majority of the time. Combining the mean percentages of the undesirable types of talk -- Individualistic On-Task, Individualistic Off-Task and Social/Emotional Negative-- yields an "Undesirable Talk" talk total of 8.35% of utterances and 5.29% of words. So, for nearly 95% of their total discussion time (by word data) these students were engaging in behavior that is well within the standards of acceptability for most classrooms. This indicates that these students were functioning quite well in terms of monitoring their social relations and their attention to their task (Corno, 1989). However, the general lack of High-Level Academic talk points to an area where substantial improvement might be gained in these group discussions. The work of Palinscar and Brown (1984, 1985) and O'Donnell, Dansereau and their colleagues (cf. O'Donnell, Dansereau, Hall, & Rocklin) offer models for developing strategic discussion skills for cooperative groups. Such training in cognitive discussion skills might contribute to more Academic High-Level verbal interaction than was observed in this study.

Interaction Content and Form by Grade and by Teacher

The lack of teacher effects on interaction content, plus the crossing of teacher and grade-level in Grade 4 (which had the most consistent grade-level effects for content and form) suggests combining the discussion of these two types of interaction effects. Grade-level effects generally showed that students in Grades 3 and 6 engaged in cooperative group interactions of a more desirable nature than students in Grade 4, both in terms of content and form. Considerable scrutiny is required to infer potential sources of these grade-level effects since many of them defy obvious developmental explanations. It

appears that the content and form of student interactions observed can be explained in terms of the tasks upon which students were working in addition to their developmental level or age.

Grade-level analyses indicated that Grade 4 was significantly lower in overall utterance length than Grades 3 and 6, which is consistent with the higher Procedural orientation and lower Academic orientation for Grade 4. In essence, the fourth graders in this study talked less strategically than did their third and sixth grade counterparts by focusing on Procedural issues rather than Academic content. The grade-level differences on the Procedural content subcategories show Grade 4 higher than Grades 3 and 6 on Nondirective talk and higher than Grade 6 on Directive talk. The greater directiveness for fourth graders compared with sixth graders is consistent with those of Wilkinson and her colleagues (Wilkinson & Calculator, 1982; Wilkinson & Spinelli, 1983) who found that students' likelihood of being directive declined by grade-level in peer work groups, although their Direct Form category was broader than the Procedural Directive category of this study, including specificity of intent as well as imperative form.

The analysis of interaction content subcategories indicates that the differences between Grades 3 and 4 on Academic talk were dissimilar from those between Grade 6 and Grade 4. The Scheffé tests indicated that Grade 3 was higher than Grade 4 on Low-Level talk while Grade 6 was superior to Grade 4 as well as Grade 3 on High-Level talk. The greater amount of High-Level talk for Grade 6 fits a developmental interpretation, while the greater orientation of Grade 3 than Grade 4 toward Academic talk does not. The significantly greater percentages of Academic Requests in Grades 4 and 6 compared with Grade 3 are puzzling. It may be that the more mature students were more socially competent in soliciting help when needed. Or it may be that the third graders were simply less confused by the tasks in which they were engaged. Again, there was a lack of teacher effects for all these variables.

A developmental interpretation can explain the greater directiveness (Procedural Direct) for Grade 4 students compared with Grade 6 students, as noted. Also, the higher levels of Academic Requests for Grades 4 and 6 may be influenced by these students' extra year or years of socialization into schooling. However, attributing to development or age the greater amount of Academic High-Level talk observed for Grade 6 students over Grades 3 and 4 appears to be an oversimplification, since Grade 3 was significantly higher than Grade 4 on general Academic and Academic Low-Level talk. No other findings from this study lend themselves to a purely developmental/years of socialization explanation.

The distribution of students' talk among the Procedural and Academic categories and subcategories of discussion content seems most related to the teachers' choices of tasks for the classroom sessions observed. An examination of the tasks being engaged by students in each of the classrooms helps to explain the uniqueness of the verbal interactions of the Grade 4 students[3].

The students in both the Grade 4 classes were taught by Teacher 3. Both classes were just beginning an activity designed to last two or more weeks in which they were designing "The Dragon Game", a board game to be played by class members. As players advanced around the board, they would encounter "hazards" designed by the various cooperative groups. These hazards would require players landing on them to complete various academic, artistic or physical activities. Cooperative groups were to develop a theme and title for their hazard, select the activities, write instructions and establish evaluation criteria. Since observations were conducted toward the beginning of the Dragon Game activity, these students were primarily concerned with procedural issues. They were trying to ascertain exactly what was expected of them, and to choose names for their hazards. Perhaps the great length of the Dragon Game project, along with the wide range of decisions faced by each group were so daunting that the students reduced the complexity of their task by focusing on its simpler procedural aspects rather than its academic aspects. This is consistent with Blumenfeld and Meece's (1988) statement regarding their study of

science instruction, that, "Tasks that are too procedurally complex may distract students' attention away from cognitive components of lessons (p. 247)." The students may have begun to engage in more academically oriented discussions farther into the Dragon activity, however, during the entire week in which observations were conducted for this study, the Grade 4 students primarily focused on Procedural issues. Nondirective talk (55.99% of utterances, 53.74% of words) comprised the majority of Grade 4 talk, resulting in the significantly higher percentage of Procedural talk, and significantly lower percentage of Academic talk compared with Grades 3 and 6. The shorter mean utterance length for Procedural talk compared with Academic talk contributed to the Grade 4 students' mean utterance length being shorter than that of Grades 3 and 6 as well.

The students in the two Grade 3 classrooms, working with Teachers 1 and 2, were engaged in the same task during all three observations. These students were to rewrite one of Aesop's Fables into play format, tape record their version of it, then perform it on finger puppets for classmates and second graders using their taped soundtracks. While many of these students' verbal interactions concerned procedural issues such as who would hold which puppet, a majority of their talk was Academic (53.21% of utterances).
As noted earlier, a majority of the third graders' talk was Academic Low-Level (50.44% of utterances), resulting in their being significantly higher than Grade 4 on this variable. Again, much of this talk consisted of the students reading aloud from their play scripts, rehearsing and revising. The long passages of oral reading among Grade 3 interactions contributed to their significantly greater mean utterance length compared with Grade 4. Even though their talk was composed primarily of Low-Level Academic interaction, the Grade 3 students were likely to have gained more cognitive benefit from their tasks during the lessons observed than the Procedurally-oriented Grade 4 students. Training in strategic discussion skills (Palinscar & Brown, 1985; O'Donnell, et al, 1987) might contribute to a greater percentage Academic High-Level talk for these students, particularly in the form of critiquing each others' writing.

The significantly higher amount of Academic talk for Grade 6 compared with Grade 4, along with the higher amount of Academical High-Level talk compared with both Grades 3 and 4 suggest some developmental effect. The longer utterances in Grade 6 compared with Grade 4 could be attributed to simple developmental differences were Grade 3's utterances not longer than Grade 4's as well. While there may be some developmental influence on the higher amount of Academic High-Level talk for Grade 6, it also appears that the tasks in which these students were engaged contributed to their relatively more strategic talk. The two Grade 6 classrooms engaged in different tasks from each other. Tasks engaged by students in Teacher 4's class were: analysis of characters in trade books using a concentric circles diagram to represent their relative importance during one observation; and planning for an elementary school memory book during the second and third observations. Students in Teacher 5's class engaged in a different activity during each observation: analysis of trade book characters by compiling and organizing clippings from magazines to represent traits; a "newspaper scavenger hunt", involving finding particular types of information and structural features in newspapers; and brainstorming ideas on how to write stories based on their second-grade book-pals' interests. Each of the activities engaged by both the Grade 6 classes offered the opportunity for the students to focus on Academic content at least at a low-level, and possibly at a high-level. The Grade 6 students engaged in interactions consistent with the nature of their tasks; these interactions were composed of fairly long utterances with a moderate amount of Academical High-Level talk. Again, training in strategic discussion skills (Palinscar & Brown, 1985; O'Donnell, et al, 1987) might improve the quality of the discussions in these classes.

Conclusions

The elementary school students in this study focused on their groups' tasks as they perceived them a great deal of the time. This is reflected in the high amounts of Procedural and Academic talk and the low amount of Individualistic Off-Task talk observed. These

students worked with their groups a great majority of the time as evidenced by the low amount of Individualistic talk. In addition they engaged in minimal antagonistic interaction as indicated by the extremely low amount of Social/Emotional Negative talk. The on-task (Stallings, 1980) and non-negative nature of these students' cooperative group discussions are quite positive findings. So too, is the far higher amount of Academic talk found in this study compared with Kalkowski's (1988).

The patterns of group content and form of verbal interaction observed appeared to be more closely associated with learning tasks than with the age or developmental level of the students. A potentially fruitful line of inquiry then, would be to examine how carefully structured instructional tasks could be used to increase the strategic content of students' cooperative group discussions. The low amounts of Academic High-Level interaction content observed in Grades 3 and 4, and the relatively modest amounts of High-Level content in Grade 6 point to an area in which cooperative group discussions could be substantially improved. Palinscar Brown (1984) and O'Donnell, et al (1987) offer models for promoting strategic discussion in cooperative groups.

This study offers a glimpse of students' discussions in cooperative learning groups during their regular literacy instruction. Content and form of verbal interaction provided a lens for understanding how cooperative group discussions can facilitate as well as inhibit opportunities for students to learn. In addition, academic tasks appeared to play an important role in orienting students' discussions toward procedural or academic content. While the small sample size and the short duration of this study limit the generalizability of findings, the naturalistic setting enhances its internal validity. Further naturalistic studies are needed to describe and interpret cooperative learning discussions as they are conducted by students in a wide variety of classrooms in order to build an understanding of cooperative learning in practice.

Footnotes

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1 The terms "cooperative learning", "peer work groups", and "cooperative groups" are defined in various ways by different authors. Since the purpose of this study is descriptive, and the type of instruction observed was entirely of the participating teachers' choosing, these terms will be used interchangeably, just as they are by many practitioners.

2 The terms "verbal interaction", "discussion", and "talk" will be used interchangeably to refer to verbal communication in a general fashion.

3 For a task framework (Doyle, 1988) analysis of this data, see Meloth & Deering, (under review).

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Table 1

Taxonomy of Verbal Interaction Content

1. Procedural (PRO)

   a. Non-directive (PND) -- Comments, suggestions or questions on the group's or an individual's actions.
   Example: "Are we supposed to do our own or just turn in one?"

   b. Directive (PD) -- An order on how the group or an individual should act.
   Example: "No, write a story front and back."

   c. Attempts at closure (PCL-- A subcategory under *directive* and *non-directive procedural utterances*) -- Efforts by a student to bring discussion on a particular topic to an end.
   Example: "OK, let's vote!"

2. Academic Content-Related (ACA)

   a. Low-level (ACL) -- Providing a simple answer or unexplained idea or reading aloud from familiar text.
   Example: "It's spelled, J-E-W-E-L-S."

   b. High-level (ACH) -- Explaining a process or metaprocess, or providing justification for an opinion.
   Example: "I think she's the most important [character in the story] 'cause everybody always asked her advice."

   c. Requests for academic content (AC?) -- Solicitation of information related to the group's academic task.
   Example: "What's a by-line?"

Table 1

3. Individualistic (IND)

   a. Individualistic On-task (I-On) -- Utterances indicating that an individual intends to work on the group's task alone.
   Example: "I'll do dragon questions since I own the book."

   b. Individualistic Off-task (I-Off) -- Utterances that are unrelated to the task and/or to the group.
   Example: "I'm going to the basketball game tonight."

4. Social/Emotional (SOC)

   a. Positive affect (SE+) -- Compliments, empathy, facilitation of the group process.
   Example: "Neat idea!"

   b. Negative affect (SE-) -- Insults, criticisms of an individual or her/his ideas.
   Example: "That's dumb!"

Table 2

Mean Percentages (and Standard Deviations) of Utterances and Words of General Verbal Interaction Content Categories

	PRO	ACA	IND	SOC
Utt	48.36% (22.46)	42.22% (24.06)	7.83% (8.99)	1.59% (2.00)
Wd	40.83% (23.06)	53.16% (24.35)	5.12% (6.54)	.69% (.56)

Utt = Utterance Wd = Word

Pro = Procedural ACA = Academic IND = Individualistic SOC = Social/Emotional

Table 3

Mean Percentages (and Standard Deviations) of Utterances and Words of Verbal Interaction Content Subcategories

	PND	PD	PCl	ACL	ACH	AC?	I-On	I-Off	SE+	SE-
Utt	42.01% (20.52)	5.62% (4.74)	0.74% (1.23)	35.68% (24.60)	3.61% (7.13)	2.92% (2.84)	2.65% (4.10)	5.18% (7.70)	1.07% (1.29)	0.52% (1.13)
Wd	37.13% (22.26)	3.36% (3.72)	0.34% (.679)	39.45% (21.38)	11.05% (17.87)	2.66% (4.07)	2.42% (4.30)	2.70% (4.87)	0.52% (.54)	0.17% (.33)

Utt = Utterance Wd = Word

PND = Procedural Nondirective
PD = Procedural Directive
PCl = Procedural Closure
ACL = Academic Content Low-Level
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AC? = Academic Content Request
I-On = Individualistic On-Task
I-Off = Individualistic Off-Task
SE+ = Social/Emotional Positive
SE- = Social/Emotional Negative

Table 4

Mean Percentages (and Standard Deviations) of Utterances in Verbal Interaction Content General Categories by Grade-Level

GRADE	PRO	ACA	IND	SOC
3	39.92% (39.92)	53.21% (53.21)	5.93% (6.76)	0.95% (.99)
4	66.01% (66.01)	22.74% (22.74)	9.45% (10.63)	1.80% (2.12)
6	37.84% (37.84)	51.14% (51.14)	8.67% (10.31)	2.35% (2.70)

Utt = Utterance Wd = Word

Pro = Procedural ACA = Academic IND = Individualistic SOC = Social/Emotional

Table 5

Mean Percentages (and Standard Deviations) of Utterances in Interaction Content Subcategories by Grade-Level

Grade	PND	PD	PCl	ACL	ACH	AC?	I-On	I-Off	SE+	SE-
3	33.89% (22.54)	5.71% (3.70)	0.61% (.607)	50.44% (28.47)	1.58% (2.30)	1.19% (1.82)	3.46% (4.97)	2.47% (4.09)	.83% (1.00)	0.12% (.24)
4	55.99% (13.39)	8.74% (4.72)	1.27% (1.27)	17.48% (9.73)	1.30% (1.90)	3.97% (2.79)	0.56% (1.37)	8.88% (8.89)	.94% (1.04)	0.86% (1.50)
6	35.97% (16.29)	1.64% (3.33)	0.23% (.23)	36.74% (15.05)	10.12% (12.10)	4.29% (3.07)	4.20% (4.33)	4.47% (6.36)	1.89% (1.89)	0.69% (1.34)

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Table 6

Mean Percentages (and Standard Deviations) of Utterances in Verbal Interaction Content General Categories by Teacher

Teacher	PRO	ACA	IND	SOC
1	43.08% (14.22)	50.58% (11.54)	5.40% (4.62)	0.95% (.43)
2	37.94% (28.02)	54.85% (33.07)	6.27% (8.10)	0.94% (1.25)
3	66.01% (13.20)	22.74% (11.70)	9.45% (10.63)	1.80% (2.12)
4	39.10% (17.89)	55.76% (20.71)	3.89% (4.30)	1.26% (1.03)
5	36.59% (20.88)	46.52% (12.77)	13.46% (12.98)	3.44% (3.58)

Pro = Procedural ACA = Academic IND = Individualistic SOC = Social/Emotional

Table 7

Mean Percentages (and Standard Deviations) of Utterances in Interaction Content Subcategories by Teacher

Teacher	PND	PD	PCl	ACL	ACH	AC?	I-On	I-Off	SE+
1	34.97% (16.49)	7.29% (3.43)	0.82% (1.06)	47.52% (11.22)	1.91% (1.35)	1.14% (.68)	3.23% (3.07)	2.16% (2.40)	0.68 (.51
2	33.22% (26.63)	4.25% (3.55)	0.47% (.62)	52.26% (36.17)	1.37% (2.81)	1.23% (2.32)	3.60% (6.07)	2.67% (5.03)	0.92 (1.2
3	55.99% (13.87)	8.74% (4.72)	1.27% (1.82)	17.48% (9.73)	1.30% (1.90)	3.97% (2.79)	0.56% (1.37)	8.89% (10.51)	9.40 (1.0
4	36.18% (12.94)	2.65% (4.64)	0.27% (.53)	39.13% (14.89)	11.98% (13.14)	4.65% (3.23)	1.66% (1.90)	2.23% (3.20)	0.84 (.98
5	35.76% (21.26)	0.63% (1.27)	0.20% (.39)	34.35% (17.08)	8.25% (12.64)	3.92% (3.36)	6.74% (4.78)	6.71% (8.42)	2.48 (2.3

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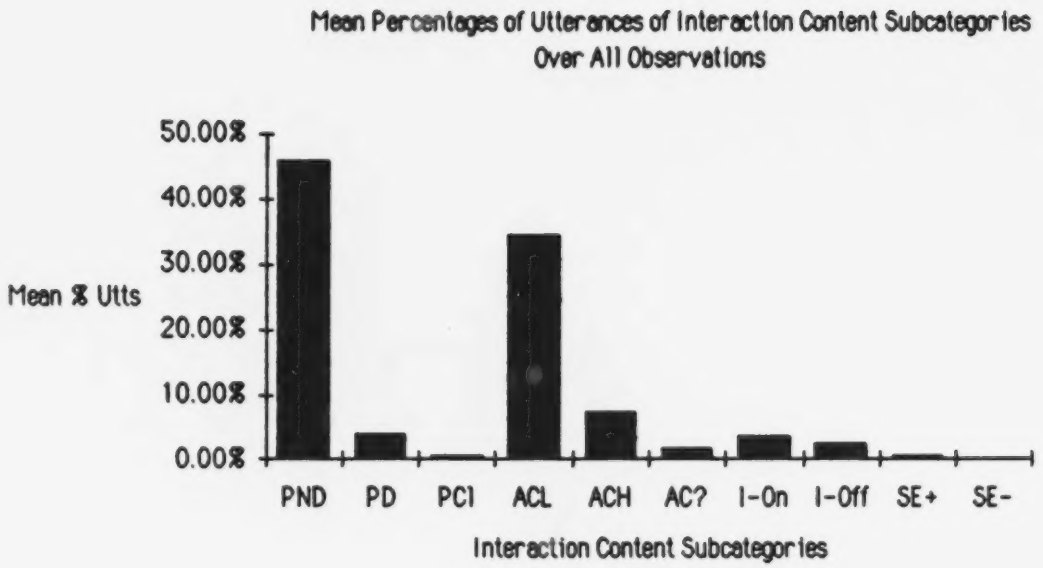
Figure 1



Legend

Utts = Utterances

PND = Procedural Nondirective
PD = Procedural Directive
PCl = Procedural Closure
ACL = Academic Content Low-Level
ACH = Academic Content High-Level
AC? = Academic Content Request
I-On = Individualistic On-Task
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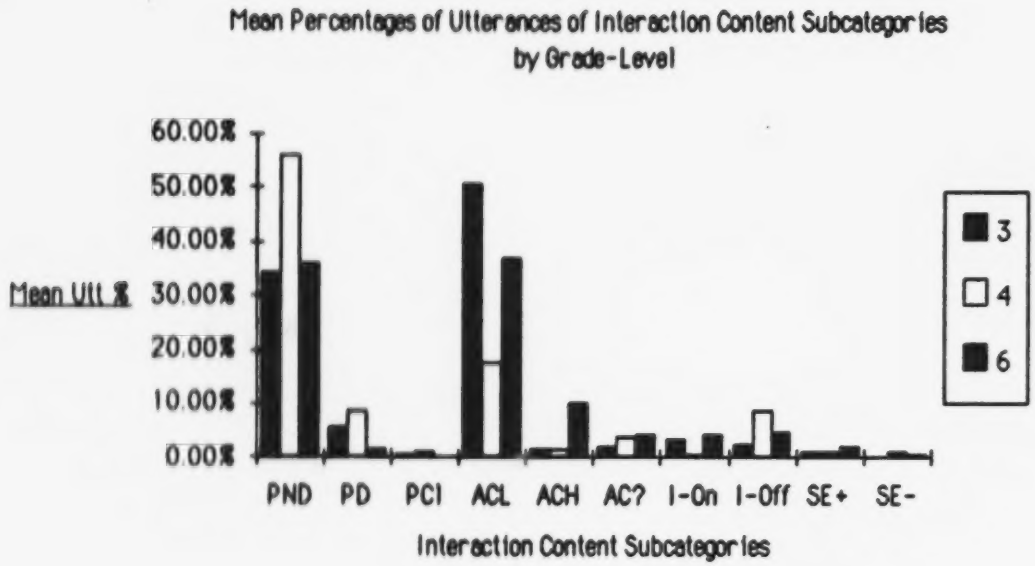
Figure 2



Legend

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Figure 3

Frequency Distribution of Utterance Lengths

Across All Observations

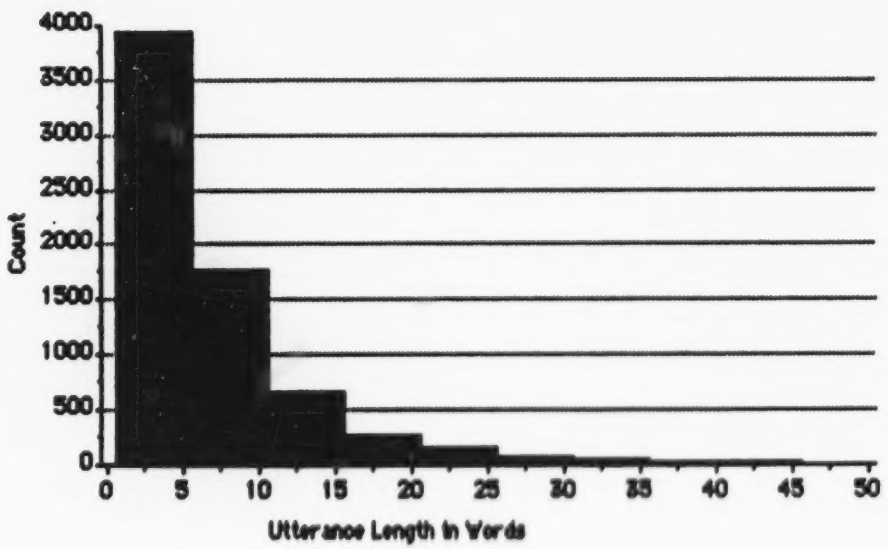
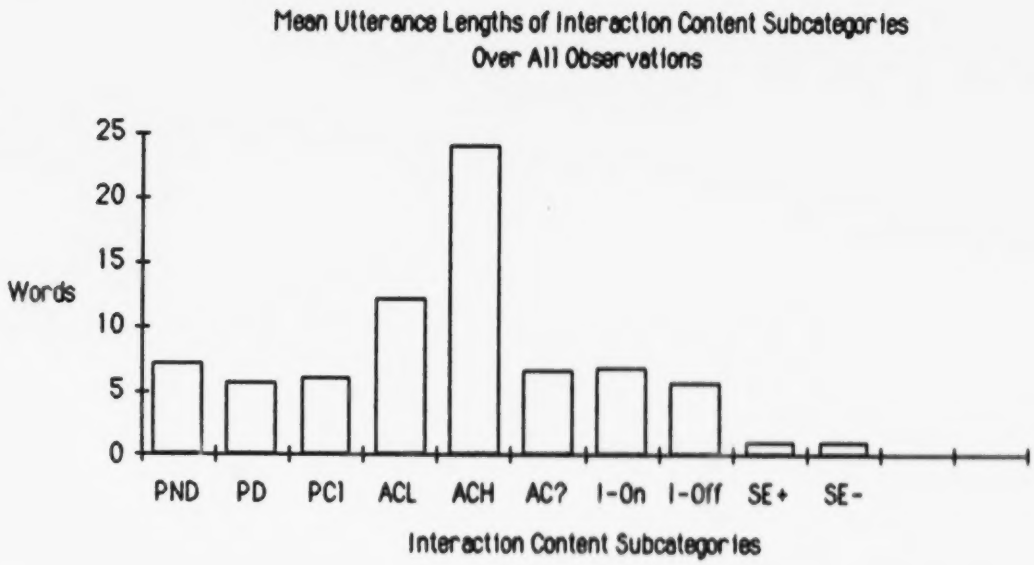


Figure 4



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